EYS

Dewatering & Composting Solutions

USER MANUAL

"SP" SERIES

EYS SCREW PRESS SEPERATORS

SP400
SP600
SP800
SP600HD
SP800HD

JAN 2012

Congratulations on your purchase of the EYS Screw-Press Separator!

We are glad that you chose EYS separator for your solid-liquid separation solutions and are confident that you will be more than satisfied with your purchase.

This manual is intended to provide basic information about the operation of the EYS Separator, and to point out to main areas of consideration while operating and maintaining the machine. Please read this manual carefully before operating the machinery, and keep it in an easily accessible place for future reference. If any of your questions or concerns are not covered in this manual, please contact the respective dealer who had installed the machinery. Your dealer's contact information is:

If you are not able to reach your dealer and in need of immediate support, then please contact EYS directly at:

EYS Metal Sanayi ve Ticaret Ltd. Şti.
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Apart from providing technical and operational instructions, this manual also includes certain safety warnings that must be followed by the user. **The safety instructions and warnings listed in this manual are by no means a complete list of all safety concerns associated with operating the machine. Users must apply common sense and abide by the general safety guidelines that govern operating of machinery.**

Contents of this manual refer to the latest product models currently in production at the time of preparation of the document. EYS reserves the right to make changes in the product design at any time.

Carefully following the instructions set forth in this manual are essential for maintaining operator safety as well as the longevity and efficiency of the machinery. Dealers must provide a copy of this manual to the customer along with the purchased product.

Please make sure that the operator in charge of operating and/or maintaining this product has full access to this manual and that he/she has read it entirely prior to running or servicing the machine. Also please record your product model number and serial number from the machine's info-tag to the following section. These info will be necessary and useful when ordering replacement parts in the future.

Congratulations again on your purchase of the EYS Screw Press Separator!

PRODUCT INFO

Product : Screw Press Separator

Model : ◯ SP400 ◯ SP600 ◯ SP800 ◯ SP600HD ◯ SP800HD

Serial Number :_____

Dealer :_____

Adress :_____

_____

Tel :_____

Fax :_____

Installation Date :_____

Manufacturer : EYS METAL SANAYİ VE TİCARET LTD. ŞTİ.
ASTİM ORGANİZE SANAYİ BÖLGESİ, HÜRRİYET MAHALLESİ, HAVAALANI BULVARI
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HAND-OVER FORM (TO BE SIGNED OFF BETWEEN THE DEALER AND THE CUSTOMER)

Product : SCREW PRESS SEPARATOR

Model : ◯ SP400 ◯ SP600 ◯ SP800 ◯ SP600HD ◯ SP800HD

Serial Number :_____

Dealer :_____

Adress :_____

_____

Tel :_____

Fax :_____

Installation Date :_____

Manufacturer : EYS METAL SANAYİ VE TİCARET LTD. ŞTİ.
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e-mail: info@e-y-s.com
internet: www.e-y-s.com

This form confirms that the product installation and start-up has been completed successfully. Basic training has been provided and this manual has been handed over to the responsible personnel below.	
Responsible person on behalf of the dealer/distributor (date and sign)	
Responsible person on behalf of the customer (date and sign; please print name)	

ATENTION !	Manufacturer's warranty is not valid unless this form is signed and dated upon installation!

INTRODUCTION

Signs And Definitions

The CE sign designating conformance with the relavant specific EC Directives as well as the General Machinery Directive, has been marked on the product by the manufacturer.

WARNING!	This warning box is used to highlight safety related precautions throughout the document. Remember that there is risk of personal injury with every "warning" sign topic and it is of utmost importance to understand and follow the contained instructions carefully.

ATTENTION !	Failure to follow instructions can result in damage to a part or the whole of the machine, possibly putting the machine out of commission.

NOTE !	It is especially important to understand and implement the instructions highlighted therein for the successful long-term operation of the machine.

Qualified Operators should be properly trained in their assigned area of responsibility, be knowledgable about general machinery handling precautions and related hazards/risks, capable of foreseeing and preventing potential damages to the machine before they happen, and be able to apply necessary first-aid practices as necessary.

Operational Responsibility
Responsibility of operating the machine in accordance with its intended purposes lies with the customer. The manufacturer is not in anyway responsible for any damages that may be caused by inappropriate handling of the waste streams resulting form the operation of the product. Likewise, the manufacturer can not be held responsible for any damages resulting from the use of un-approved and/or non-original spare parts on the machine.

Second-hand Ownership
In the case of transfer of ownership of the product to a new customer, the original owner is responsible for handing over this user-manual to the new owner. New owner must be informed and trained about the basic operation of the product accordingly.

Operational Liability
The entire liability of operating the product properly lies with the customer. The customer is responsible for making sure that the product is used in accordance with the guidelines set forth in this document, plus other general machinery operating rules that may not be covered here but are expected to be known by any machinery operator. The maximum liability of the manufacturer in any event can not exceed the monetary value of the product itself.

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1 SAFETY INSTRUCTIONS

Check conformance with safety instructions prior to each start-up!

1. In addition to the specific instructions contained in this document, general machinery operating rules and precautions must be followed!
2. Safety related signs are marked on the product as necessary. These signs and stickers are important for personal safety, so do not remove them!
3. Do not operate the machine before replacing/installing all safety and protection related parts/covers!
4. Make sure you understand the general functioning principle of the machine before operation!
5. Put on relatively snug operational outfit when operating the machine. Loose outfits and long sleeves can get caught by the moving parts during operation and servicing.
6. Slurry can emit flammable gases under certain conditions; so avoid smoking or carrying open fire near the machine!
7. Machine should be installed at a properly ventilated area. Avoid spending long periods of time in poorly ventilated areas around the slurry!

Maintenance

1. Never perform any maintenance, service or cleaning before fully stopping the machine and the other system components.
2. Always check and verify that the bolts/nuts on the machine are securely tightened.
3. Always wear work gloves when handling sharp and metal objects during maintenace.
4. Always observe local regulations when disposing of lubricants/grease, etc.
5. Never work on the control panel and/or electrical connections without fully cutting off the power first.
6. Only manufacturer approved spare parts must be used for repairs and replacements.

2 GENERAL INSTRUCTIONS

2.1 Working with slurry

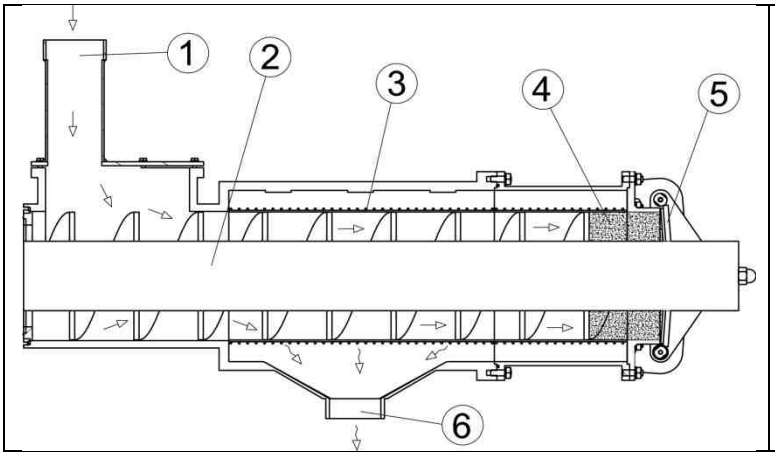
WARNING !	Slurry can emit flammable and nauseus gases. Always ensure that there is proper ventilation in the operation area.

2.2 Proper Usage

EYS screw press separator is designed to separate solid and liquid phases of fiber-rich waste materials. The waste should be free of sand, as well as other foreign objects such as metal, glass, wood, etc. that have the potential of damaging the internal parts of the separator.

3 OPERATION PRINCIPLE

Slurry can be fed into the EYS Separator either by a pump or gravimetrically through a hopper at the inlet. The auger inside the separator moves the slurry forward from the inlet section towards the solids discharge outlet. During this travel of the slurry, the cylindrical screen around the auger continously dewaters the liquid fraction of the slurry and channels it out through the liquid discharge outlet. Meanwhile the dewatered solids form into a firm plug as they get closer to the discharge area. At the solids discharge outlet, there are two hinged doors that apply constant pressure to the solid plug by means of counterweights attached to the arms that regulate the angle of these doors. As the auger furthers the solid plug forward, the plug overcomes the backpressure applied by the discharge doors and exits the machine from the discharge outlet.



1. Slurry inlet
2. Auger
3. Screen
4. Solid plug
5. Separated solids discharge
6. Separated liquid discharge

Operational efficiency of the separator (throughput and dryness of solids) is greatly affected by the slurry consistency. Therefore performance results may vary depending on what kind of slurry is being dewatered. Following principles should be kept in mind when optimizing performance.

- Separation efficiency is typically increased when a larger screen slot-size is used. This in turn will result in more solid particles to escape into the separated liquid phase.
- Smaller screen slot-size typically results in less solids percentage in the separated liquid phase. However throuhput will be lower with smaller screen slot-sizes.
- Moisture content of the separated solids is typically reduced with increased back-pressure at the discharge doors.

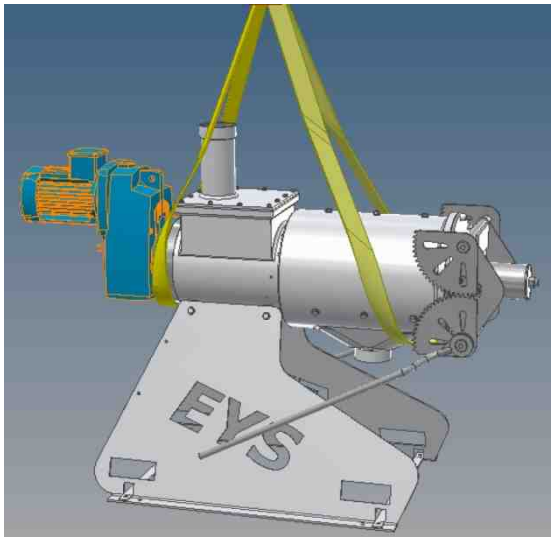
4 INSTALLATION AND START-UP

4.1 Delivery

EYS Seperator is delivered fully assembled; in a secure crate. Net weight of each model is as follows.

	SP400	SP600	SP800	SP600HD	SP800HD
Net Weight [kg]	450	700	850	950	1100

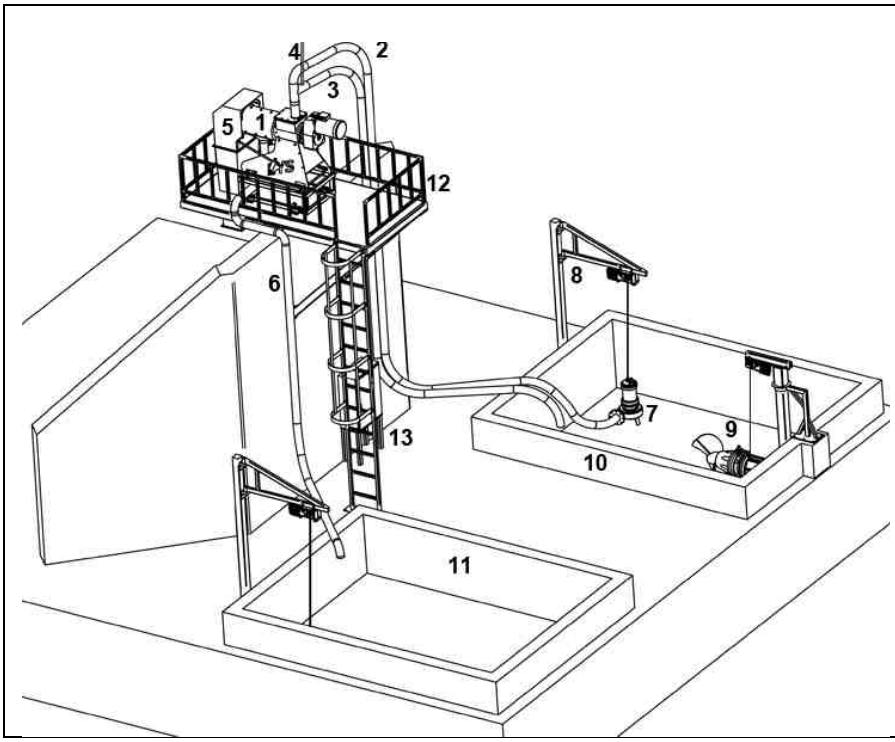
4.2 Handling



The machine must be handled and lifted with a safe and proper method as required by the specific circumstances of the installation location. A suitable crane and/or forklift must be utilized. Please refer to the above figure for proper lifting arrangements by forklift or crane.

WARNING !	A properly chosen forklift can be used for transferring and/or lifting of the separator to short distances or heights. Use the specifically designed forklift openings on the legs of the separator. Make sure that the forks of the forklift are fully through these openings on both legs. A crane should be employed when lifting the separator to higher locations (such as while installing on an elevated platform). When lifting with a crane, use two slings of 3m length and 1ton lifting capacity each, together with proper shackles. Apply the slings as shown in the above figure. Never lift with chain or steel cable. These lifting procedures must be followed not only for initial installation but for subsequent liftings also, whenever necessary.

4.3 Typical Installation



1. Separator
2. Inlet pipe (from pump)
3. Overflow pipe
4. Air-vent pipe
5. Solids cover (optional)
6. Liquid effluent drainage pipe
7. Pump
8. Pump inst. fixture
9. Agitator & inst. pole
10. Slurry pit
11. Liquid effluent pit
12. Separator platform
13. Electric control panel

4.4 Set-up and Installation

ATTENTION !	Separator should be installed at a reasonable height to allow separated solids to accumulate easily underneath. Otherwise the separator may become buried under accumulated solids. The separated liquid fraction will be drained to a separate lagoon (other than the slurry pit where the separator is being fed from) gravimetrically. Therefore this lagoon should be planned close to the separation system in order to allow for easy drainage of the liquid.

Follow the below steps for setting up the separator:

- Mount the F-Pipe to the inlet pipe of the separator.
- Mount the pump outlet pipe to the 6" upper inlet of the F-Pipe using the quick coupling connectors.
- Mount a 6" over-flow pipe to the lower branch of the F-Pipe using the quick coupling connectors. This overflow line will go directly back to the slurry pit where the pump is.
- Connect the 1,5" air-vent pipe to the over-flow line. This line will prevent a possible vaccum effect on the over-flow line. This air-vent pipe should extend at least 1m above the upper branch of the F-Pipe (pump line). Make sure that the valve on the air-vent pipe is free and open.
- Mount a 6" pipe to the liquid discharge outlet of the separator. This pipe will extend to the separated liquid lagoon. The layout of this pipe should not cause dips along the path, which would prevent the liquid to drain completely and may cause freeze-ups in the pipe.
- All electric work and connections must be carried out by a qualified electrician.

ATTENTION!	Overflow and separated liquid drainage lines must extend in a linear fashion to allow easy flow of the slurry. Overflow line must not be submerged into the slurry pit, otherwise it might creaate siphoning effect and divert all slurry flow from the pump back into the same pit through the overflow line.

ATTENTION !	If the pump feeding the separator is not an EYS pump, then a suitable pump must be used to supply the minimum flow rates as per the below table. Otherwise the

	separation efficiency will be compromised. Pipe diameters should not be lower than 4" in order to minimize headloss.

	SP400	SP600	SP800	SP600HD	SP800HD
Recommended Pump Capacity [m3/h]	20	50	75	20	50

5 PRE-STARTUP CHECKS

- Check the oil level in the gearbox, add the appropriate amount if necessary. Make sure the oil cap is in place on the gearbox.
- Check that all piping connections are securely in place and free of any obstacles.
- Adjust the motor protection relay to the recommended value (factory settings for EYS supplied control panels are: 4,4A for 2.2kW motor, 11A for 5.5kW motor, 22A for 11kW motor). The auger of the separator turns counter-clockwise during separation. However with each start-up, the auger first turns in clockwise direction (backwards) for 5 seconds in order to releave any excess pressure on the gearbox due to potentially stuck solid plug inside the machine from the previous run.
- **Remove the counterweights from the arms to minimize the counter pressure.**

ATTENTION !	Make sure that the slurry pit where the separator is being fed from is free of foreign ojects such as sand/metal/wood pieces that can harm the machine. The slurry pit is an essential part of your separation system. Such foreign objects can cause significant damage to auger and the screen of the separator, and abrasive materials such as sand would wear out these two parts very quickly also.

6 START-UP

ATTENTION !	It is essential to mix the slurry in the slurry pit thoroughly prior to starting the separator. Lack of proper agitation in the slurry is one of the main causes of low separation efficiency. Agitation needs to be done prior to start of pumping so that homogenous material is pumped to the separator.

6.1 Counter-pressure on discharge doors

The consistency and dryness of the solid plug is adjusted by the positioning of the counter-weights on the separator arms. Counter-pressure is increased as the weights are moved outwards towards the open end of the arms.

ATTENTION !	With each adjustment of the counter-pressure, the results will change after a minute or two. **Therefore please wait for a couple of minutes after each adjustment to observe the change in solids output.**

6.2 Establishing the solid plug

The solid plug will form soon after the separation system is started. First run-and-stop the pump for a couple of seconds. Then wait until no slurry remains in the pipes, and repeat the procedure again. After 3-5 repeats, the plug will have established and solids will start coming out of the discharge end.

An alternative practice is to first open the discharge doors carefully and manually fill the space behind the doors with straw or newspaper as a temporary plug. Then the separator and the pump can be started up in sequence. The plug will form shortly after start up.

6.3 Plug adjustment

	If the plug is too dry, Push the counterweights forward or remove some of the counterweights. If the plug has dried up inside the separator for a long time, it may stall the separator. Always arrange the counterweights symettrically on both arms of the separator.
	If the plug is too wet, Push the counterweights backward to apply higher counter-pressure on the discharge doors. If not enough, add on more counterweight on each arm. If the plug gets too loose, the plug may breakdown and when that happens, liquid slurry would shoot out from the solids discharge. In that event stop the system and re-start following the start-up procedures.

Making these adjustments will be necessary to reach optimum separation efficiency with a given slurry consistency. Adjustments may need to be fine-tuned when the slurry consistency changes significantly due to heavy rain, etc.

6.4 Other points of consideration

Overflow line back to the slurry pit must allow free flow of slurry within at all times.

> Make sure that the overflow line is free of any obstacles and is not clogged and/or frozen! In regular operation, overflow line should be about 1/3 filled with slurry.

Excessive pump thoughput into the separator may lower separation efficiency.

> If the pump chosen for the separation system delivers too high a flow, the slurry inlet into the separator should be regulated with a valve on the inlet pipe.

Open end of the overflow pipe must not be submerged into slurry in the slurry pit; as this situation would create a siphoning effect and all the slurry being pumped through the separator inlet pipe would then flow back into the slurry pit, preventing the slurry from flowing into the separator.

Overflow and liquid slurry drainage lines should not be exposed to conditions that might change their diameters (such as a vehicle driving over the line, other weights being applied on them, etc.). This would increase the pressure inside the pipe and may cause the plug to shoot out from the separator.

In installations where two (or more) separators are installed side by side, one larger capacity pump can be used instead of individual small pumps for each separator. In those instances, a collector buffer tank can be arranged above the separators and a single pump can feed this collector, from which the individual separators would be fed. A level control sensor would be useful in the buffer collector.

Slurry inlet pipe of the separator should not be smaller than 4" (Ø100mm). The inlet pipe should maintain a constant diameter throughout its length. If these conditions can not be maintained, then use of a bufferr tank above the separator and feeding the separtor from this tank would be recommended.

Make sure the slurry is fully mixed prior to separation. This will prevent from loss of solids plug unexpectedly due to very thin slurry input, or stalling of the separator motor due to very thick slurry input. If the slurry pit very small (e.g., smaller than 100m3), then avoid over-agitation as this may change the fiber structure of the slurry and make the slurry less separable.

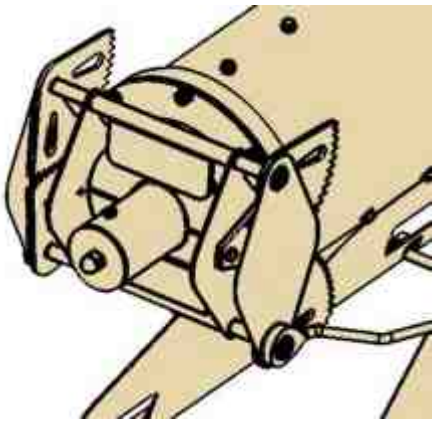
The separator should be installed as close to the slurry pit as possible, in order to maintain the optimum piping layout and minimize frictional losses inside the pipes. Layout of the pipes become particularly important in situations where the horizontal distance between the separator and the pit is more than 10m. Make sure that the slurry pump line and the overflow line extend from the separator to the slurry pit always with a downward inclination.

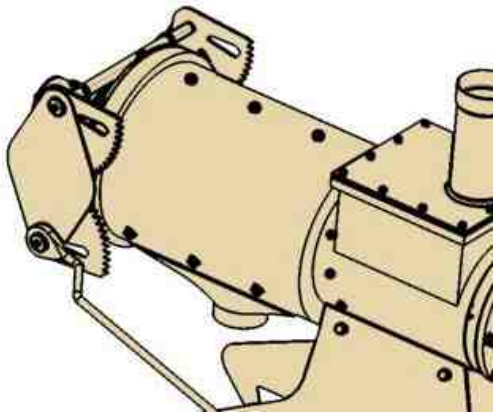
The separated liquid discharge of the separator is 4" (Ø100mm). Sthe liquid drainage line from the separator to the separateed liquid lagoon should be a minimum of 4" (Ø100mm). In order to avoid spihoning effect on this line, or to prevent freezing of slurry inside the pipe, or to avoid blockage as a

result of solids settlement inside the pipe, make sure that the line extends from the separator to the liquid lagoon with a vertical inclination throughout its length.

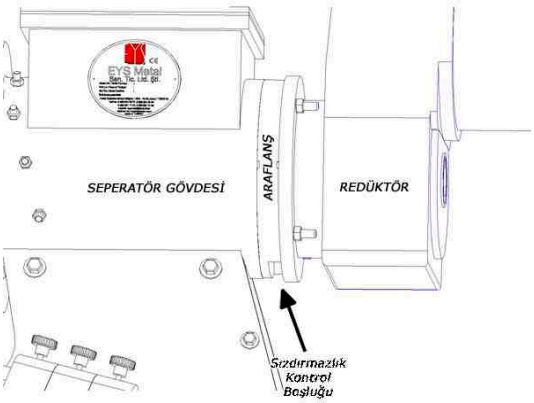
In extremely cold climates, the pipelines can be wrapped with thermal insulation materials to prevent freezing of the slurry. In any event, application of electric heaters around the pipes must be avoided as these may pose a fire hazard in the vicinity of insulation materials.

Slurry pit is an integral part of your separation system, and it is essential that this pit is kept free of foreign objects that might disrupt the slurry flow through the pipes and/or damage the separator parts (such as metal parts / wires, plastic parts, wood pieces, sand, large pieces of cloth, plastic bags, etc.). Mechanical and electrical damages that might occur as a result of such materials inside the slurry are customer's responsibility.

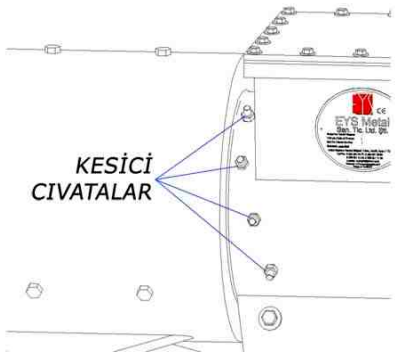




Solids discharge of EYS separators are designed with a gear mechanism that maximizes precision of counter-pressure adjustment. Even though these gears do not move much during operation, hands must be kept free of these areas at all times when the separtor is running. Make sure that the protective cover is kept on at all times other than when servicing the machine. Loose outfits, sleeves and gloves must be kept away from these gears with utmost attention. When servicing the machine, utmost care must be taken when the protective cover is off; hands must be clear of the gears at all times.



There is a "gearbox separation flange" between the body of the separator and te gearbox. This flange houses a combination of seals that prevent slurry from running into the gearbox. Should both seals fail inside this flange, the slurry still doesn't leak into the gearbox but leaks down from an opening on the underside of the flange. Operator should visually check for any leaks in this area periodically. If a leak is seen, the seals inside the separation flange need to be replaced. Call your dealer for help with these replacements.



There are cutter screws on each side of the separator at the slurry inlet area. These screws are placed to catch long fibers and otherwise foreign objects before they enter the screen area and blind the screen. These cutter screws are adjusted and fine-tuned at the factory prior to shipping. Do not alter the settings of these screws unless there is a specific need for it.

7 TROUBLESHOOTING

Problem	Potential Cause	Solution
Seperator stalls	Motor overload Plug is too dry	Check the setting of the motor protection relay in the control panel, make sure it is in accordance with the maximum values in table 13.2.3.
	Foreign objects blocking the auger	Clean the auger, screen and the separator inlet area under the F-pipe.
Low solids output, very dry solid plug	Too much counter-pressure on discharge doors	Re-adjust counterweights (See section 5.1)
Premature wear of auger and screen	Abrasive foreign materials in slurry (e.g. sand, too much straw, etc.)	Control the material flow to the slurry pit to keep such materials out of the slurry.
Frequent changes in dryness of the solid plug;	Changing slurry consistency	Make sure the slurry in the pit is mixed thoroughly
very low solid and liquid discharge from the separator	Insufficient slurry inflow to the separator	Double check rotational direction of the pump. Make sure pump line is free of obstacles and blockage.
		If the slurry is too thick to be pumped effectively, dilute it to enable easy flow of slurry.
	Overflow line is siphoning the slurry back into the slurry pit.	Make sure the air-vent line on the overflow pipe is open and functioning .
		Adjust the pump flow into the separator with a valve if the pump is too powerful. Overflow line should be filled with slurry upto 1/3 to ½ of its diameter. Make sure the overflow line is free of any obstacles and is not blocked. Make sure that the overflow line is NOT submerged into slurry in the slurry pit.
	Screen is blinded	Run the separator auger backwards to help clean the screen. Take the screen out and clean it.
	Worn auger and/or screen	Check the auger outer diameter and the tolerance between the auger and the screen. Replace if necessary.
	Screen is worn only in one narrow section	Check screen guide-rail adjustments

Problem	Potential Cause	Solution
No solids output, very little separated liquid output	Auger is turning backwards	Check the electrical connections, reverse connections if necessary.
	Solids are stuck between auger flighting and are co-rotating with the auger	Take out and clean the auger.
Plug is breaking down and liquid slurry is coming out with solids	Very low solid material in the incoming slurry (very thin slurry).	Make sure slurry pit is agitated properly. Use a smaller slot-size screen, if the incoming slurry is too thin despite sufficient agitation.
	Counterweights are too far out towards the discharge end of the arm (not enough counterpressure)	Refer to section 5.1
Slurry is leaking from underside of the gearbox-separation flange continuously	Seals inside the flange need to be replaced	Replace the seals. ***NOTE: It is normal for a small amount of slurry to leak from these seals during the first couple of days of operation after the first start-up, until the seals are saturated with liquid. Then the leak would stop.
Very little or no solids output, no separated liquid output, and most slurry is flowing back through the overflow line	Overflow line is siphoning the slurry back into the slurry pit	Make sure the air-vent line on the overflow pipe is open and functioning . Make sure the overflow line is free of any obstacles and is not blocked. Make sure that the overflow line is NOT submerged into slurry in the slurry pit.
	Separated liquid discharge line is blocked / clogged	Clean the inside of the separator body. Check the liquid drainage line and eliminate any blockages. Make sure the liquid discharge line/pipe is not kinked or clogged.
Very little or no solids output, most slurry is flowing back through the overflow line; but there is separated liquid output	The inlet area of the separator is blocked	Dismantle the F-pipe and clean the inlet area of the separator.
	Very little solids in the slurry (slurry too thin)	Cut any external water sources draining into the slurry pit. Make sure that the separated liquid from the separator is not directed back into the slurry pit!
Slurry is coming out of the air-vent line	Pumping and overflow connections are incorrect	Reverse the connections: make sure the pump inlet is connected to the upper

		branch of the F-pipe; and the overflow is connected to the lower branch. Air-vent line is too short. Make sure this pipe is at least 1m long and minimum of 2" in diameter
The separator throughput drops significantly after a period of proper operation	Slurry consistency change in the slurry pit Too much rainfall or other sources of water flowing into the pit Auger and/or screen worn out	Slurry that had been stored for a long time may have been added to the pit prior to separation. This causes the fibrous structure of the slurry to loosen up and makes the slurry less separable. Run the separator until the slurry in the pit is used up, then add fresh slurry into the pit. Cut such diluting flows directed to the pit Check the wear on auger and screen, replace if necessary (see section 12)

8 STOPPING THE SEPARATOR

1. Turn off the pump.
2. Turn off the separator couple of minutes after the pump stops.
3. Seperator can be left idle as such for up to a week.
4. If the separator will remain idle for longer periods of time, then the inside of the separator should be cleaned of any slurry inside.
5. In extreme cold weather conditions make sure all the pipes are emptied from slurry after the operation, in order to prevent freezing inside the pipes.

9 LONG TERM STORAGE OF THE SEPARATOR

If the separator is going to be idle for extended periods of time, clean the machine by taking out the auger and the screen, and assemble the cleaned parts back in.

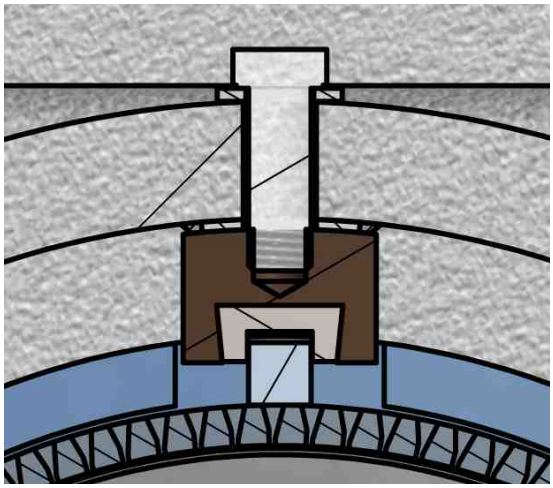
If the machine will be shipped or taken out of commission for good, make sure to empty the gearbox and dispose of the transmission oil in accordance with your local environmental regulations.

10 CHECKING THE SCREEN AND SCREEN GUIDE-RAILS

Screen(s) inside the separator and the guide-rails that hold the screen in place will wear out over time. It is recommended to check these parts for potential wear every 1.000hrs of operation (roughly once every 5-6 months for 6hr/day operation).

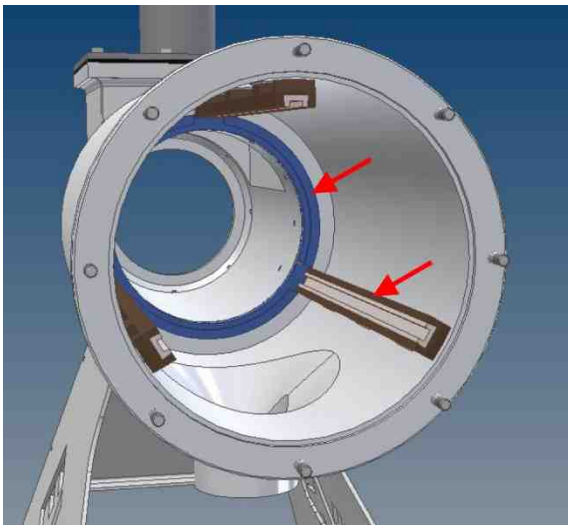
During these checks, first the screen should be removed from the machine and cleaned (preferably with a pressure washer). Then visually check for any damages and visible wear on the parts. Also check that the teflon inserts inside the guide-rails have a flat and continuous contact surface with the screen as well as the bottom of the guide-rail itself. Worn out teflon inserts can cause subsequent damage to the screen. If necessary, replace these teflon inserts each time you replace the screen.

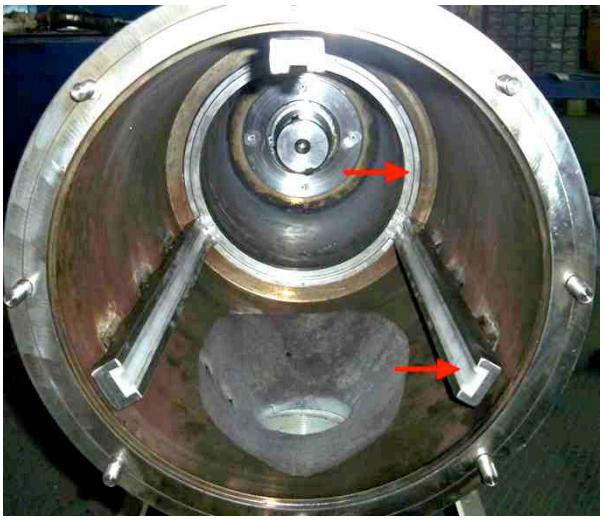
See section 12 for details on acceptable levels of wear for these parts and how to control them. Disassembly and assembly of the screen is explained in section 13.



Screen guide rails are fastened to the separator with 3 sets of screws each. These screws must not be tampered with unless there is a specific need for it. These screws have been adjusted to the optimum torque at the factory and typically would not need re-adjusting until the guide-rails and/or the teflon inserts inside them are replaced. Please consult with your EYS dealer for details on how to make these adjustments after a replacement.

ATTENTION !	Do not loosen the screws that hold the guide-rails in place (see picture in section 11.1; where these screws are denoted with [4]). Otherwise the screen and the auger may get damaged.





Another part to be checked periodically is the "body wear ring" that sits at the deep end of the separator body and supports the screen. This part prevents the screen to continually rub against the body of the separator during operation. This part needs to be replaced when the wear on the diameter reaches 1mm.

11 CHECKING THE AUGER

The auger is stainless steel and has special hard-coating applied on it for prolonged protection from wear. Under normal operating conditions, the auger should last 2-3 times longer than the screen. But it is recommended that the auger is also checked for wear and damage every time the screen is checked. There can always be foreign materials mixed into the slurry stream, which can cause premature damage to the flightings of the auger.

The wear typically happens on the outer diameter of the auger flightings along the length of the auger, as well as the front face of the flightings wear the auger rubs against the solid plug towards the discharge end. When the auger wears out at these points, soon premature wear and damage will likely appear on the screen also. Please refer to section 12 for acceptable levels of wear on the auger.

Disassemble and assemble the auger as per the directions under section 13. Make sure that the cutter screws explained in section 6.4 are not interfering with the auger. These cutter screws should first be tightened until they touch the auger flighting, and then reversed back slightly (e.g. 30-45°) so as to leave a small gap between the screw's tip and the outer diameter of the auger flighting. If the screws are touching the auger, then vibration and deflection from its rotational axis can be observed on the auger. If this happens, re-adjust the cutter screws as explained above. Cutter screws should be checked every 12.000hrs or operation, or each time the auger is replaced/removed.

12 ACCEPTABLE WEAR AND LIMIT TOLERANCES

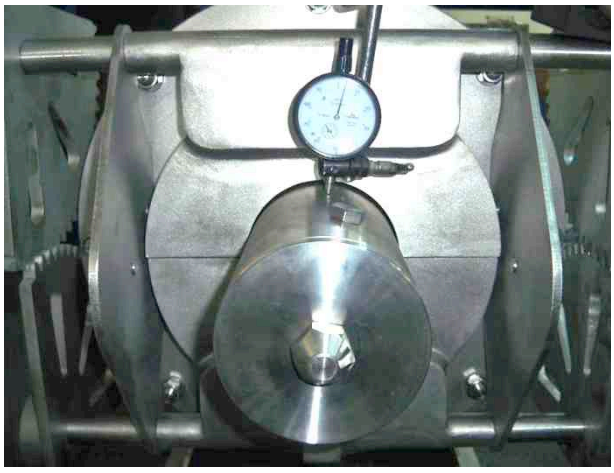
All moving/working parts on the separator will eventually wear out. Periodic checks on these wear parts is essential for prolonged life of these parts and for preventing disruption of service of your

separator. Worn parts need to be replaced after the limit tolerances are reached, otherwise they can cause subsequent damage to other parts that are otherwise not yet due for replacement.

Immediate parts that are going to directly affect the operation of the separator once they are worn are the screen and the auger. There can always be other reasons for malfunction or drop in separation efficiency, so plese refer to the toubleshooting section of this manual first. The screens can not be repaired once they are worn or damaged. Augers can be recoated if necessary. Augers can only be recoated at EYS factory according to its original specifications.

WARNING !	Do not use a non-authorized auger inside your separator. No repairs or rebuilds should be attempted on the auger. This would not only void the manufacturer's warranty, but can cause serious damage to your machine. The screen can not be repaired once it's worn or damaged. Continueing to use worn/damaged screens by trying to repair them will result in further undue damages to your machine, and will void your manufacturer's warranty.

Wear on the screen causes an increased ID (inner diameter) of the screen, as well as enlarged slot-widths between the screen wires. Wear on screen and auger affects the separation efficiency directly; throughput drops, moisture level of the separated solids increases, amount of solids in the separated liquid goes up. In standard models (non-HD models), normal operating tolerance between the screen and the auger is 0.4mm-0.5mm on the radius (0.8mm-1.0mm in diameter). Tolerances above this range will start creating problems and should be avoided. If the screen is replaced, check the tolerance/gap between the screen and the auger. If this gap is more than 1.0mm on the diameter, then the auger needs to be replaced also. When the auger is replaced, its deflection from the rotational axis when running should be measured by help of a comparator (see below pictures). Maximum acceptable deflection on the diameter of the auger shaft is 0.25mm. Connection between the auger and auger hub should be checked for cleanliness and greased to ensure a proper mating between these two parts.



Most important indication of screen and/or auger wear is a noticable drop in separation efficiency. If such a drop in separation efficiency, or a significant increase in moisture of the separated solids, or

noticable increase in the solid content of the separated liquid is observed, it is possible that either the screen or the auger (or both) will neeed to be replaced. Refer to the troubleshooting section of this manual first to eliminate other possible causes for these problems prior to deciding on replacing the screen/auger.

It should also be observed whether the hard-coating on the auger flightings is intact and visible. The picture on the right below shows an auger on which the hard-coating is completely worn out and vanished, as a result of which the flighting under the hard-coating has experienced irreversable wear and damage. The picture on the left shows a proper auger with acceptable amount of hard-coating on it.

If the auger isworn beyond repair, it might be more feasible to simply order a new auger rather than shipping it back to EYS for a recoat. Please consult your dealer for assistance on auger replacements.

Amount of wear on the hard-coating layer can be determined by measuring the flighting thickness of the auger. In all EYS separator models the flightings in the compression zone (flightings towards the discharge end of the auger) are made of 10mm thick material, and then the hardcoating is applied. Therefore if your measurement of the flighting thickness is 10mm or less, it means that the hardcoating has been worn out completely.

When the screen is worn, it should be replaced without much delay. Otherwise the wearing of the auger would be accellerated as well.

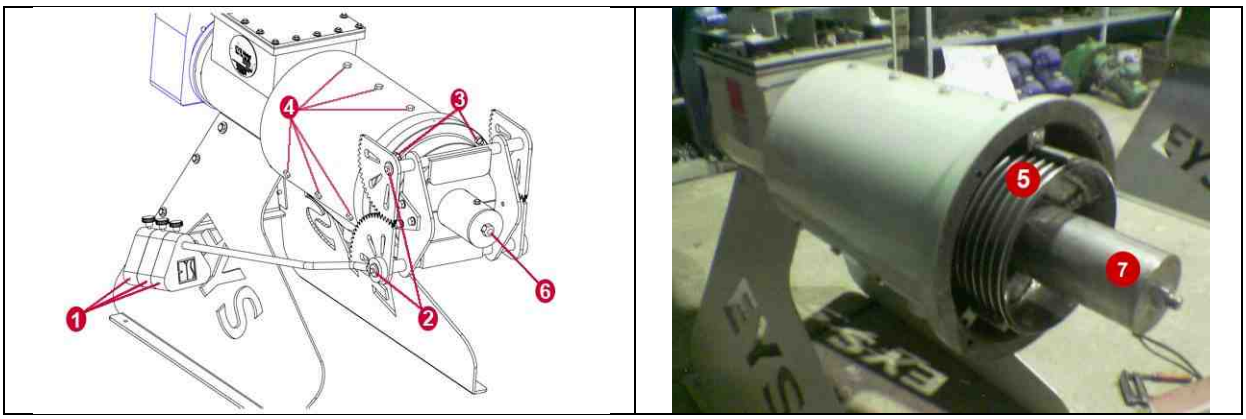
13 DISASSEMBLY AND ASSEMBLY

13.1 Disassembly

Partial disassembly of the separator parts will be necessary in the following circumstances.

- Cleaning of the auger and/or the screen
- Replacement of the auger and/or the screen.
- Cleaning of the separator body to get rid of blockages due to unexpected materials
- To clean the long-waited and dried up material inside the separator from the auger and screen surfaces

First shut down the separator as per the instructions in section 8, and then follow the directions below.



1. Remove all the counterweights [1] from the arms.
2. **Do NOT remove the screws [2] that attach the arms to the discharge doors**.
3. Remove the discharge mechanism altogether by removing the 8xM12 nuts [3] on the discharge flange.
4. **Do not touch the screws [4] holding the screen guide-rails in place**.
5. Pull the screen out.
6. To remove the auger, loosen the M20 nut [6] on the end cover of the auger (the auger will automatically release itself from the auger hub when this nut is undone).
7. Carefully pull the auger out.

WARNING !	Pay utmost attention not to put your hands between the gears on the discharge mechanism! Do not hold the discharge mechanism from the gears or from the arms for your safety.

WARNING !	When removing the counterweights on the arms, remove them one by one. When the positioning screws on the counterweights are loosened, the weight may fall off the arm by gravity, which could be dangerous. So always hold each counterweight by the other hand when loosening the screw on the counterweight.

13.2 Assembly

Dismantled parts are assembled back onto the machine by following the steps under 13.1 in the reverse order. Once all parts are assembled back together, make sure all moving parts can move freely.

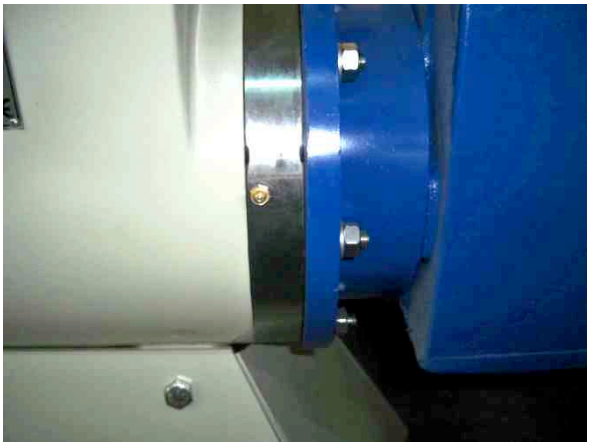
When assembling the auger, clean the mating surfaces of the auger stem and the auger hub, and apply grease on these surfaces t o ensure a secure grip between the two parts. Then tighten the M20 nut on the end cover of the auger ([6] in the above figure) .

ATTENTION !	If any unforeseen problems are encountered or an additional step other than the ones explained above seems to be necessary during disassembly and assembly, contact your dealer for advise.

ATTENTION !	While disassembling or assembling the machine, do not use impact tools such as a hammer. Screen, screen guide rails or auger are precision parts that can be damaged by such tools.

14 GENERAL MAINTENANCE

Gearbox
The motor and the gearbox of your separator come ready to use when the machine is delivered. The gearbox is already filled with the necessary amount of oil. The gearbox oil should be changed every 10.000hr of operation. Please refer to section 16 for motor and gearbox specifications.



Greasing
Gearbox separation flange needs to be greased regularly for the seals inside it. This needs to be repeated every 2.000hours of operation at a minimum (weekly intervals would be better). There is a greasing tip on the flange (see above figure). Make sure to clean this tip clean before and after each greasing.

Cleaning
If the screen is clogged with long fibers and/or other blocking material, clean the screen thoroughly from both inside and outside, preferably with a pressure washer.

WARNING !	When the machine is running, never touch/hit/lean on any moving parts. Any intervention must be done after the machine has been stopped and the power shut off. Cut off all power to the control panel of the machine from the outside switch on the control box. Make sure that nobody else can start the machine while you are working on it. Never put your hands on or near the turning auger.

15 STORAGE

If your EYS separator will not be used for prolonged periods, it is best to uninstall the machine and keep it in a dry and safe enclosure. It i also recommended to place some moisture absorbants (such as silica gel) in the electrical connection box on the motor. Replace the gearbox oil (with AGIP VSF 320 or equivalent). Dispose of the old oil in accordance with your local environmental regulations.

16 TECHNICAL SPECIFICATIONS

16.1 Seperator Technical Specifications

	SP400					
MOTOR	Q1E100L4A-05H		PA100L4A-42-Q3EH		Q2E100L4C-KG-H	
Power	2,2 kW	2,5 kW	2,2 kW	2,2 kW	2,2 kW	2,5 kW
Voltage	220/380 V	255/440 V	230/460 V	230/460 V	220/380 V	255/440 V
Freq.	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Rpm	1430	1715	1460	1750	1430	1725
GEARBOX	PD32100L4A		PD32		PD32	
Oil	BP ENERGOL GR-XP220		BP ENERGOL XP220		BP XP220 ENERGY	
İ	52,92		64,11		52,92	
Rpm	27	32	23	27	27	33
IEC / PAM	N/A		PAM100L4A		PAM100L4C	

	SP600					
MOTOR	132M/4B		132M/4C		132M/4B	
Power	5,5 kW	6,3 kW	4,8 kW	5,5 kW	5,5 kW	6,3 kW
Voltage	380/660 V	440/760 V	230/460 V	230/460 V	380/660 V	440/760 V
Freq.	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Rpm	1430	1715	1460	1735	1430	1715
GEARBOX	PD42 132M/4C		PD42		PD42	
Oil	KLUBERSYNTH GH 6-320					
İ	43,65		52,23		43,65	
Rpm	38	39	28	33	38	39
IEC / PAM	PAM132M/4B		PAM132M/4B		PAM132M/4B	

	SP800			
MOTOR	132M/4B		132M/4C	
Power	5,5 Kw	6,3 kW	4,8 kW	5,5 kW
Voltage	380/660 V	440/760 V	230/460 V	230/460 V
Freq.	50 Hz	60 Hz	50 Hz	60 Hz
Rpm	1450	1740	1460	1730
GEARBOX	PD52 PAM132M/4C		PD52 PAM132S/4C	
Oil	KLUBERSYNTH GH 6-320			
İ	41,96		51,45	
Rpm	35	41	28	34
IEC / PAM	PD52 PAM132M/4C		PD52 PAM132M/4C	

	SP600HD			
MOTOR	132M/4B		132M/4C	
Power	5,5 Kw	6,3 kW	4,8 kW	5,5 kW
Voltage	380/660 V	440/760 V	230/460 V	230/460 V
Freq.	50 Hz	60 Hz	50 Hz	60 Hz
Rpm	1445	1730	1460	1730
GEARBOX	PD73 132S/4C		PD73 132S/4C	
Oil	KLUBERSYNTH GH 6-320			
İ	123,12		150,32	
Rpm	12	14	10	12
IEC / PAM	N/A		PD73 132S/4C IEC	

	SP800HD			
MOTOR	132M/4C		160L/4A	
Power	11 Kw	12,7 kW	9,6 kW	11 kW
Voltage	380/660 V	440/760 V	330/460 V	330/460 V
Freq.	50 Hz	60 Hz	50 Hz	60 Hz
Rpm	1450	1740	1475	1770
GEARBOX	PD73 IEC 132M/4C		PD73 IEC 160L/4A	
Oil	KLUBERSYNTH GH 6-320			
İ	59,52		68,14	
Rpm	24	29	22	26
IEC / PAM	PD73 132S/4C IEC Ø32		PD73 160L 4A IEC Ø32	

16.2 Machine Tags

When you call your dealer for consultance, service or replacement parts, please keep your machine tag information handy. There are three separate tags on your separator – one on the separator body, one on the gearbox and the other one on the motor.

16.2.1 Seperator tag

Model number, date of production and serial number are on this tag.

16.2.2 Gearbox tag

N. gearbox serial number
TYPE gearbox type/model
n_2 gearbox output rpm
i transmission ratio
An additional sticker on the gearbox designates the oil type used in the gearbox.

16.2.3 Motor tag

Motor type/model, standards that it conforms to, serial number, insulation class, weight, voltage/frequency and connection information, cosϕ and motor rpm.

16.3 Warning signs

There are two warning sign stickers on the separator.
One is on the motor fan cover, and shows the operational rotation direction of the motor and the auger.

The other one is on the gearbox separation flange, and shows the greasing tip where the grease is to be applied during periodic checks.

17 ELECTRIC CONTROL PANEL

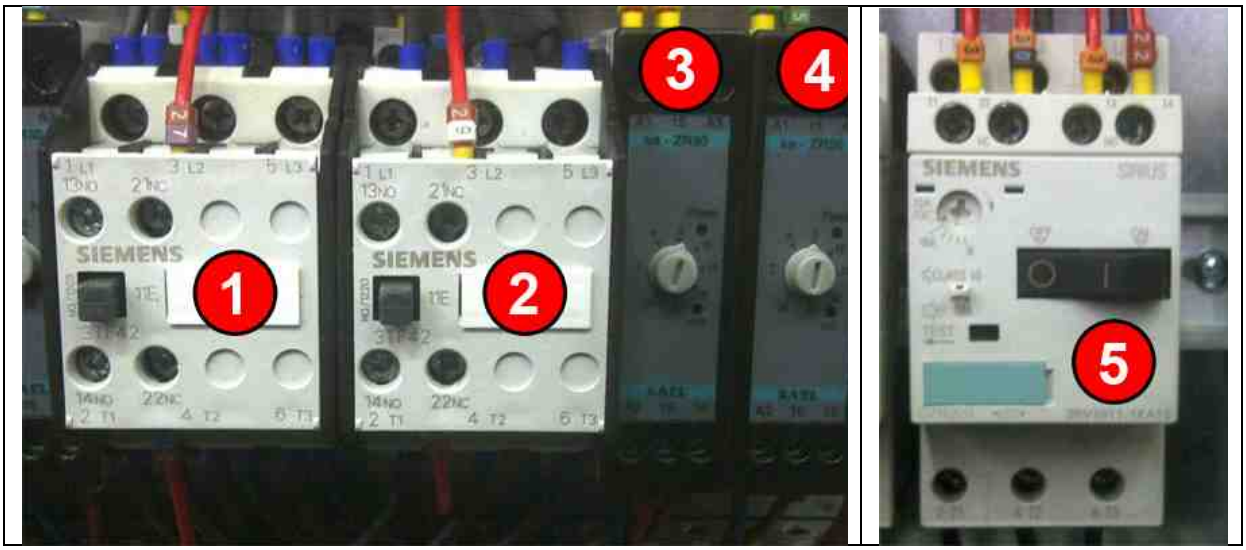
Contents of the electric control panel will vary depending on the components of your separation system. EYS offers stand-alone control panels for each machine, as well as a single and central control panel to command all components of the system.

17.1 Wiring diagrams

You can find the relevant wiring diagrams at the end of this manual.

17.2 Reverse-run of auger at start-up

Each time the separator is started from the control panel, the auger first turns in reverse direction for a short period of time. This prevents damage to the gearbox due to any unexpected blockage inside the machine left over from the previous run. Also, it helps clean the inside surface of the screen from before the separation starts.
Following paragraph explains how these adjustments can be altered when necessary.



When the separator is started up, contactors [1] and [2] are activated. Each contactor commands the auger to turn in one direction.

The time relay [3] adjusts the duration of reverse-run at the start-up (i.e. how long the auger will turn backwards). The default factory setting is 5 seconds, which is the recommended value. It is possible to increase it up to 30sec.

The time relay [4] adjusts the time lag after the finish of the reverse-run until the start of auger run in the regular direction. This is also set to the default value of 5 seconds at the factory.

Motor protection relay [5] prevents the motor from burning as a result of drawing too high an amper value. Default factory setting of this relay is as per the below table for each separator model. Do NOT increase the setting of the motor protection relay above these values.

	SP400	SP600	SP800	SP600HD	SP800HD
Motor Protection Relay Max. Settings [Amper]	4	11	11	11	22

18 SPARE PARTS LIST

Parts list for your separator can be found at the end of this manual.

19 MANUFACTURER'S WARRANTY

All EYS products are under warranty for 12 months from the date of installation against all manufacturing defects.

20 EC DECLARATION OF CONFORMITY

EC DECLARATION OF CONFORMITY

CE

MANUFACTURER	EYS METAL SAN. VE TİC. LTD. ŞTİ.
ADDRESS	ASTİM ORGANİZE SANAYİ BÖLGESİ HAVAALANI BULVARI HÜRRİYET MAHALLESİ NO:233 TEPECİK, AYDIN, TURKEY

The undersigned Company certifies under its sole responsibility that the item of equipment specified below satisfies the requirements of the Machinery Directive 2006/42/EC which applies to it. The item of equipment identified below has been subject to internal manufacturing checks with monitoring of the final assessment by **EYS METAL SAN. VE TİC. LTD. ŞTİ.**

PRODUCT	SCREW PRESS SEPARATOR
MODEL / TYPE	SP400, SP600, SP800, SP600HD, SP800HD
DIRECTIVES	MACHINERY DIRECTIVE 2006/42/EC LOW VOLTAGE DIRECTIVE 2006/95/EC

REGULATIONS APPLIED ACCORDING TO HARMONIZED STANDARDS
EN ISO 12100:2010, EN 60204-1:2006, EN ISO 13857

Place and date of issue	AYDIN / TURKEY 11.2012
Name and position of authorized person	ORHUN ÇETİN TECHNICAL MANAGER
Signature of authorized person	EYS EYS METAL Sanayi ve Ticaret Ltd. Şti. Astim Organize Sanayi Bölgesi Hürriyet Mah Havaalanı Bulvarı No:233 Tepecik / AYDIN Tel & Fax: 0256 231 09 98 Güzelhisar V.D. 928 016 1326